

# DOCTOR OF PHILOSOPHY WITH A MAJOR IN OCEAN SCIENCE AND ENGINEERING

The mission of the graduate program in Ocean Science and Engineering (OSE) is to educate the next generation of transdisciplinary ocean scientists and engineers by combining the basic and applied sciences with innovative ocean technologies, and to advance interdisciplinary research at the frontiers of the physical, biological, chemical and human dimensions of ocean systems.

Georgia Tech's transdisciplinary PhD OSE program is designed to train and prepare PhD level scientists to identify and solve foundational and applied problems in the ocean sciences and engineering. Training such students involves ensuring that students are well versed in a diverse set of quantitative toolkits in addition to having developed expert-level knowledge and experience in applying quantitative methods. Hence, the program training defines core topics across the three Schools and the essential knowledge required by the students. The expectations exceed that of traditional PhDs in science or engineering as OSE requires an additional layer of integration between the science and engineering and involves research immersion. The program delivery is organized around four priorities:

**Priority 1.** Develop an OSE student & faculty community at GT.

**Priority 2.** Prepare students to perform high-quality research in OSE.

**Priority 3.** Support students as they become independent OSE experts.

**Priority 4.** Align students' research with job opportunities in academia, government and industry.

All PhD programs must incorporate a standard set of Requirements for the Doctoral Degree.

The PhD degree in OSE requires a minimum of 32 semester hours of coursework to cover the core topics articulated in the essential knowledge list (EKL). Students will be considered "in good academic standing" if they are making satisfactory progress toward completion of the degree, and have met a cumulative grade point average (GPA) equal or greater to 3.2 for the number of credits that they have attempted.

Students enrolled in the OSE program are expected to be trained and knowledgeable in at least three core topics of ocean science and engineering (one in each School). This training is available through courses provided in the different schools participating in the program. The core topics are:

**CEE:**

- Coastal & Ocean Mechanics
- Environmental Biotechnology

**BIO:**

- Marine Ecology & Conservation
- Biological & Microbial Oceanography

**EAS:**

- Physical and Chemical Oceanography
- Ocean & Climate

For each of the three selected topics the students will choose one or two courses for a total of 4 **core courses** around which they will build their Essential Knowledge List (EKL). The EKL will provide the foundation for the Comprehensive Exam to be taken by all students by the end of the second year. Depending on the student background, the program of study may require taking additional courses to fulfill the core topic requirement, or may partially lessen the course load if the student can demonstrate to have acquired the necessary foundation in one of the topics (this applies for example to students with a Master degree relevant to any of the Research Themes). An EKL containing the selection of core topics and associated courses must be completed and approved by the **OSE Graduate Studies Committee (GSC)** by the end of the first semester.

The OSE PhD program requires completion of four 3-hour credit courses between the ones listed below. Student must choose at least one core topic and one class from each school. First year students must also attend the OSE Seminar (2 credit hours).

Code	Title	Credit Hours
<b>OSE Core Courses</b>		<b>14</b>
EAS 8802	Special Topics (OSE Seminar)	
Four courses spanning at least 3 courses, at least one from each School:		
CEE Core Topics:		
Coastal and Ocean Mechanics:		
CEE 6261	Environmental Fluid Mechanics	
CS 8803	Special Topics (Coastal Mechanics)	
Biology Core Topics:		
Marine Ecology and Conservation:		
BIOL 6417	Marine Ecology	
BIOL 6221	Biological Oceanography	
Biological and Microbial Oceanography:		
BIOL 6410	Microbial Ecology	
BIOL 6221	Biological Oceanography	
Earth and Atmospheric Sciences Core Topics:		
Physical and Chemical Oceanography		
EAS 6305	Physical and Chemical Oceanography	
EAS 6122	Biogeochemical Cycles	
EAS 6490	Advanced Environmental Data Analysis	
Ocean and Climate:		
EAS 6140	Thermodynamics of Atmospheres and Oceans	
EAS 8803	Special Topics (Climate and Global Change)	
<b>Ethics/RCR Training Requirement</b>		
<b>OSE Specialization:</b>		<b>9</b>
Elective courses that increase depth of understanding in the research theme chosen by PhD candidate		
<b>Minor:</b>		<b>9</b>
Courses outside the students' selected themes		
<b>Total Credit Hours</b>		<b>32</b>